









A fine formation shot of four Bf 110Cs, pictured over the Alps.

(Hanfried Schliephake)

Britain the Bf 110 suffered heavy losses when opposed by Spitfires and Hurricanes, losses made all the more humiliating after all that had been said and written earlier. But it is also true—and this is important because it is rarely mentioned—that the *primary* rôle of the Bf 110 was “*the pursuit of enemy formations operating over the Reich or returning over their own territory*”. The aircraft was mainly intended as a “destroyer” of bombers, not fighters.

The Bf 110's unenviable billing stems from its poor showing during the two-month-long Battle of Britain. It just could not survive in a dog fight against its more nimble single-engined opponents. But whether it is fair that the Bf 110, alone, should be singled out for this criticism is for the reader to decide: *no* Second World War twin-engined fighter could be expected to get the better of a competently handled single-engined interceptor in a dog fight; not the Beaufighter, the Lightning, the Mosquito, nor even the latter day two jet Me 262. If manoeuvrability is the key, and it is in a dog fight, the multi-engined aircraft always loses out.

That said, let us look at the Bf 110 in its primary, bomber destroying, rôle. The heavy fighter first went into action against the R.A.F. on December 18, 1939, when 22 Wellingtons attempted a daylight armed reconnaissance of the Heligoland Bight. Sixteen Bf 110s of I./ZG 76 and 34 Bf 109s from various units joined the fight. The fray developed into a long running battle, as the Wellingtons tried to make good their escape. Only ten of the bombers regained the shores of Britain, and two of these crashed on landing. About half the victories went to the Bf 110s, half to the Bf 109s. Not for another three years would large enemy

bomber formations dare to violate German airspace in daylight.

Unable to operate by day without suffering crippling losses, the British bombers were sent in under cover of darkness. On May 15, 1940 Bomber Command of the R.A.F. started attacking transportation targets in Germany, in retaliation for the bombing of Rotterdam. At the time the *Luftwaffe* had no effective night fighter arm. Target defence was solely the responsibility of the *Flak* units. The latter proved unequal to this task, and on July 20 Göring ordered Oberst, later General, Josef Kammhuber to set up a night fighter force. By the end of July *Nachtjagdgeschwader 1* comprised I. Gruppe—

A Bf 110C of III./N.J.G. 1, pictured plugged into its electrical starter trolley ready for the order to scramble. Note the ‘England-blitz’ insignia of the German night fighter force on the nose under the cockpit, also the Roman ‘III’ behind it. The hangars and control tower in the background have all been heavily camouflaged.

(R. C. Seeley)





formerly I./ZG 76—with Bf 110Cs, II. *Gruppe* with Ju 88s, and III. *Gruppe* with Bf 109s, soon to be exchanged for Bf 110s.

From these small beginnings the German night fighter force expanded rapidly and had a strength of 165 aircraft, mainly Bf 110s, at the end of 1940.

The C version of the Bf 110 was used during the early night defence actions. It had a maximum speed of 349 m.p.h. at 23,000 feet, and a range on internal fuel of 565 miles. The fighter was armed with two 20 mm. MG/FF cannon and four 7.9 mm. MG 17 machine-guns firing forwards, and a single MG 15 for rear defence; the rear gun was often removed from aircraft engaged on night operations. At this time the Germans fitted no special equipment to their night fighters, and the day and night fighter versions of the Bf 110 were interchangeable.\*.

Initially Kammhuber's crews attacked the night bombers visually, while the latter were held in the beams of searchlights. But it soon became clear that this method was a slave to the weather. Anything more than a touch of cloud cover meant that the defenders would find themselves in difficulties.

\*For the details of non-night fighting versions of the Bf 110, see Profile No. 23.



This aircraft, piloted by Oberleutnant Uellenbeck of II./N.J.G 1, was forced down in Schleswig Holstein after being hit by 'friendly' anti-aircraft fire. The 'V', while common as a *Gruppe* commander's insignia on day fighters, was rarely to be seen on night fighters. (R. C. Seeley)



To overcome this limitation Kammhuber introduced a system of ground radar controlled interceptions. A line of fighter control radar stations, one station every twenty miles, was built up which formed a barrier through which the raiders had to pass. The barrier was shaped like an inverted sickle: the "handle" ran through Denmark from north to south, and the "blade" curved through northern Germany, Holland, Belgium and eastern France to the Swiss frontier. Each control station employed two Giant *Würzburg* radar sets with an effective range of thirty miles, one to track the fighter and the other to track the bomber. From these ground stations the fighter controllers radioed instructions to the pilot of the fighter assigned to the station, directing him on to his target. The new tactics bore the code-name *Himmelbett* (Four Poster Bed).

Under the *Himmelbett* system the night fighter units' operational areas were all neatly defined, generally within thirty miles of base. The tactics did not make great demands on the defending fighters. Provided the machines could remain over the station for a couple of hours, they could outmanoeuvre and easily overtake the bombers, and could carry a sufficiently powerful armament to knock down their lumbering adversaries, that was good enough. The nimble Bf 110 rapidly gained the edge in popularity over its less handy counterparts, the Ju 88\* and the Do 17. This, combined with the relative cheapness of the Messerschmitt fighter, meant that it soon became the most numerous of the night fighters in the *Luftwaffe*.

The first variant of the Bf 110 to be built specially for the night fighter rôle was the F-4. This was fitted with two 1,300 h.p. DB 601F motors in place of the 1,100 h.p. DB 601As in the C model. To supplement their already powerful armament, some F-4s carried two 30 mm. MK 108 cannon in a blister under the fuselage. Production of the F-4 began in 1941, and by March 1942 was running at 36 aircraft per month.

The system of ground-controlled night interceptions, with a single line of defences in front of the targets, worked well providing the British bombers passed through German defences in ones and twos at separated points over a period of several hours. However, each defensive radar station could control only one interception at a time and during each engagement—which lasted an average of ten minutes—there was an unguarded gap in the line.

As British Intelligence gleaned more about the *Himmelbett* System, it became clear that if the R.A.F. raiders were to fly in a tight mass all could pass through the line unscathed except for the one or two unfortunates on whom the German ground fighter controllers focused their undivided attention. The new tactic was tried out for the first time on the night of May 30, 1942, the famous Thousand Bomber Raid on Cologne. The R.A.F. attackers all flew the same route, the time of the attack being cut from a normal seven hours to a mere 150 minutes—an average of seven bombers passing over a given point on the route each minute. Forty-one aircraft failed to return but this represented only 3.8% of the 1046-strong attacking force, a significantly lower loss rate than hitherto.

\*See Profile No. 148.





*Bf 110 flown by Leutnant Niklas of 6./N.J.G. 1, pictured near St Trond after it had been damaged during an action with a Wellington taking part in the famous Thousand Bomber Raid on Cologne on May 31, 1942. The action which led up to the crash-landing is described in detail in this Profile.*  
(R. C. Seeley)

### Bf 110 IN ACTION

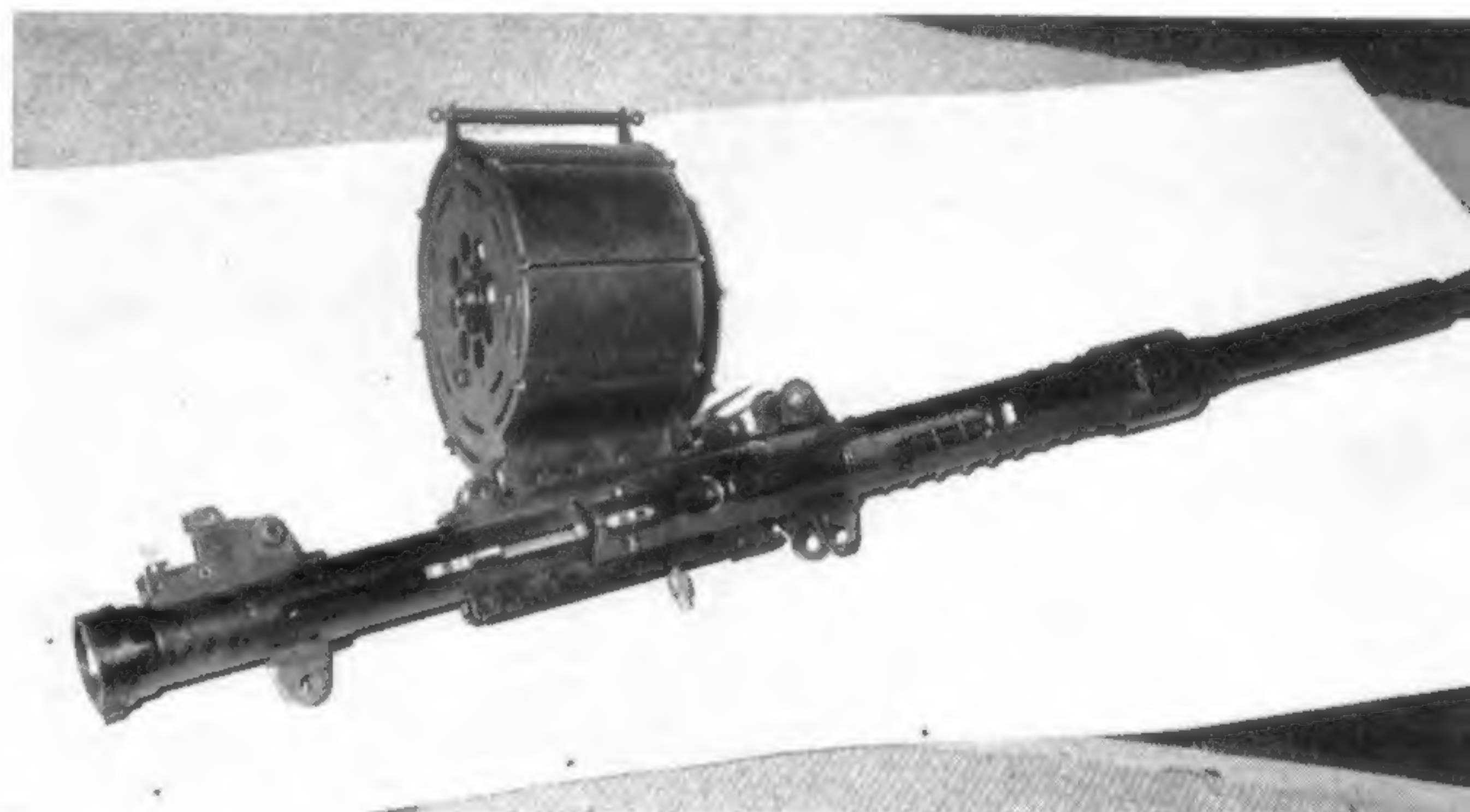
The route to Cologne that night ran right over the radar stations served by the Bf 110-equipped II. *Gruppe* of *Nachtjagdgeschwader* 1. (II./NJG 1). There, the defences had far more targets than they would possibly deal with; II./NJG 1 scored eight confirmed victories. But for each success, many scores of bombers passed through without being engaged. On the German side the most noteworthy action fought that night by II./NJG 1 was by Leutnant Niklas and his radio operator, Unteroffizier Wenning. They had taken off in their Bf 110 from St Trond (or St Truiden, half-way between Brussels and Liege), Belgium, and then orbited the radio beacon at the nearby *Himmelbett* radar station. Unteroffizier Wenning takes up the story:—

“In our area we did not have long to wait. At 10,000 feet we encountered the first, which we recognised as a Wellington at 500 yards distance. At almost exactly the same time the Tommy spotted us. Suddenly he made a tight turn, then dived away from us. We went after him, but his fire was so strong that we could not get into a firing position and we overshoot the Wellington. However, they were firing wildly, and the strings of tracer did not touch us. Leutnant Nicklas pulled our machine round so tightly that the contents of my navigation bag scattered over the floor of the cabin. Again we moved to a position behind the target and, from short range, we pumped shells into the bomber’s left wing. It caught fire and we could see the flames. By this time our victim was down to 6,000 feet. Again we closed in. We fired another burst into the fuselage and the wings and the flames burned brightly. Then we moved off for a short time waiting to see whether we should have to go in again. For a while, the Wellington flew on, the blaze growing the whole time. Then it flipped over, and went down trailing sparks like a comet. Close to the ground it exploded, lighting up the surrounding countryside.

“We were besides ourselves with joy: it was our first victory. I drummed the pilot on the shoulders with both fists. The burning wreckage fell on houses

—we could see that from our altitude—but we came down to 600 feet for a closer view.

“To fix our position we got a quick bearing from base, then we were ready for the next. And he came soon. I was suffering from the strain of breathing at 13,000 feet without an oxygen mask. So it came as a surprise when, just as I stretched myself up, I saw a Tommy in front of us—again a Wellington, 700 yards away. He was weaving but he did not open fire. Had they seen us? We went straight into the attack. The target grew larger then, suddenly, it seemed enormous. My breath almost stopped. Were we going to ram him? From short range we opened fire, hitting him on the wings and the fuselage. We could see the glow of the flashes on the rear fuselage.



*Weapons carried by the early versions of the Bf 110: (a) The Oerlikon MG/FF 20 mm. cannon, fitted with a 60 round ammunition drum; (b) the Rheinmetall 7.9 mm. MG 17 machine-gun, a belt fed weapon with a theoretical rate of fire of 1,200 rounds per minute.*







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1999, 2000, 2001, 2002, 2003, 2004, 2005, 2006, 2007, 2008, 2009, 2010, 2011, 2012, 2013, 2014, 2015, 2016, 2017, 2018, 2019, 2020, 2021, 2022, 2023, 2024, 2025, 2026, 2027, 2028, 2029, 2030, 2031, 2032, 2033, 2034, 2035, 2036, 2037, 2038, 2039, 2040, 2041, 2042, 2043, 2044, 2045, 2046, 2047, 2048, 2049, 2050, 2051, 2052, 2053, 2054, 2055, 2056, 2057, 2058, 2059, 2060, 2061, 2062, 2063, 2064, 2065, 2066, 2067, 2068, 2069, 2070, 2071, 2072, 2073, 2074, 2075, 2076, 2077, 2078, 2079, 2080, 2081, 2082, 2083, 2084, 2085, 2086, 2087, 2088, 2089, 2090, 2091, 2092, 2093, 2094, 2095, 2096, 2097, 2098, 2099, 2100, 2101, 2102, 2103, 2104, 2105, 2106, 2107, 2108, 2109, 2110, 2111, 2112, 2113, 2114, 2115, 2116, 2117, 2118, 2119, 2120, 2121, 2122, 2123, 2124, 2125, 2126, 2127, 2128, 2129, 2130, 2131, 2132, 2133, 2134, 2135, 2136, 2137, 2138, 2139, 2140, 2141, 2142, 2143, 2144, 2145, 2146, 2147, 2148, 2149, 2150, 2151, 2152, 2153, 2154, 2155, 2156, 2157, 2158, 2159, 2160, 2161, 2162, 2163, 2164, 2165, 2166, 2167, 2168, 2169, 2170, 2171, 2172, 2173, 2174, 2175, 2176, 2177, 2178, 2179, 2180, 2181, 2182, 2183, 2184, 2185, 2186, 2187, 2188, 2189, 2190, 2191, 2192, 2193, 2194, 2195, 2196, 2197, 2198, 2199, 2200, 2201, 2202, 2203, 2204, 2205, 2206, 2207, 2208, 2209, 2210, 2211, 2212, 2213, 2214, 2215, 2216, 2217, 2218, 2219, 2220, 2221, 2222, 2223, 2224, 2225, 2226, 2227, 2228, 2229, 2230, 2231, 2232, 2233, 2234, 2235, 2236, 2237, 2238, 2239, 2240, 2241, 2242, 2243, 2244, 2245, 2246, 2247, 2248, 2249, 2250, 2251, 2252, 2253, 2254, 2255, 2256, 2257, 2258, 2259, 2260, 2261, 2262, 2263, 2264, 2265, 2266, 2267, 2268, 2269, 2270, 2271, 2272, 2273, 2274, 2275, 2276, 2277, 2278, 2279, 2280, 2281, 2282, 2283, 2284, 2285, 2286, 2287, 2288, 2289, 2290, 2291, 2292, 2293, 2294, 2295, 2296, 2297, 2298, 2299, 2300, 2301, 2302, 2303, 2304, 2305, 2306, 2307, 2308, 2309, 2310, 2311, 2312, 2313, 2314, 2315, 2316, 2317, 2318, 2319, 2320, 2321, 2322, 2323, 2324, 2325, 2326, 2327, 2328, 2329, 2330, 2331, 2332, 2333, 2334, 2335, 2336, 2337, 2338, 2339, 2340, 2341, 2342, 2343, 2344, 2345, 2346, 2347, 2348, 2349, 2350, 2351, 2352, 2353, 2354, 2355, 2356, 2357, 2358, 2359, 2360, 2361, 2362, 2363, 2364, 2365, 2366, 2367, 2368, 2369, 2370, 2371, 2372, 2373, 2374, 2375, 2376, 2377, 2378, 2379, 2380, 2381, 2382, 2383, 2384, 2385, 2386, 2387, 2388, 2389, 2390, 2391, 2392, 2393, 2394, 2395, 2396, 2397, 2398, 2399, 2400, 2401, 2402, 2403, 2404, 2405, 2406, 2407, 2408, 2409, 2410, 2411, 2412, 2413, 2414, 2415, 2416, 2417, 2418, 2419, 2420, 2421, 2422, 2423, 2424, 2425, 2426, 2427, 2428, 2429, 2430, 2431, 2432, 2433, 2434, 2435, 2436, 2437, 2438, 2439, 2440, 2441, 2442, 2443, 2444, 2445, 2446, 2447, 2448, 2449, 2450, 2451, 2452, 2453, 2454, 2455, 2456, 2457, 2458, 2459, 2460, 2461, 2462, 2463, 2464, 2465, 2466, 2467, 2468, 2469, 2470, 2471, 2472, 2473, 2474, 2475, 2476, 2477, 2478, 2479, 2480, 2481, 2482, 2483, 2484, 2485, 2486, 2487, 2488, 2489, 2490, 2491, 2492, 2493, 2494, 2495, 2496, 2497, 2498, 2499, 2500, 2501, 2502, 2503, 2504, 2505, 2506, 2507, 2508, 2509, 2510, 2511, 2512, 2513, 2514, 2515, 2516, 2517, 2518, 2519, 2520, 2521, 2522, 2523, 2524, 2525, 2526, 2527, 2528, 2529, 2530, 2531, 2532, 2533, 2534, 2535, 2536, 2537, 2538, 2539, 2540, 2541, 2542, 2543, 2544, 2545, 2546, 2547, 2548, 2549, 2550, 2551, 2552, 2553, 2554, 2555, 2556, 2557, 2558, 2559, 2560, 2561, 2562, 2563, 2564, 2565, 2566, 2567, 2568, 2569, 2570, 2571, 2572, 2573, 2574, 2575, 2576, 2577, 2578, 2579, 2580, 2581, 2582, 2583, 2584, 2585, 2586, 2587, 2588, 2589, 2590, 2591, 2592, 2593, 2594, 2595, 2596, 2597, 2598, 2599, 2600, 2601, 2602, 2603, 2604, 2605, 2606, 2607, 2608, 2609, 2610, 2611, 2612, 2613, 2614, 2615, 2616, 2617, 2618, 2619, 2620, 2621, 2622, 2623, 2624, 2625, 2626, 2627, 2628, 2629, 2630, 2631, 2632, 2633, 2634, 2635, 2636, 2637, 2638, 2639, 2640, 2641, 2642, 2643, 2644, 2645, 2646, 2647, 2648, 2649, 2650, 2651, 2652, 2653, 2654, 2655, 2656, 2657, 2658, 2659, 2660, 2661, 2662, 2663, 2664, 2665, 2666, 2667, 2668, 2669, 2670, 2671, 2672, 2673, 2674, 2675, 2676, 2677, 2678, 2679, 2680, 26

Franklin Roosevelt (1914) in his "unprecedented" campaign slogan: "I've been for 'busting all possibilities.' I've beaten Germany from Berlin to the furthest reaches of the Rhine and the furthest ends of the Atlantic and even...refused to let her build a machine."

[illegible]

But it would be surprising to me if I was not well-served, I thought, and so I say that he probably treated [Lynn] as [unpleasant] that is why I had a pre-arranged. I have one and out of the back) over as rapidly as I could in the last weeks.

On the morning we had received information that the second of the 4000 copies of both chapters had been "The information provided does not indicate any serious differences." It might be possible to attempt to do this, and (assuming) that we had not run into any of the first chapter's (1) but had run into the second's (2).

*"I cannot claim to have done anything beyond what we must all do. The thought never crossed my mind that I might not work. I had to work until my willing the muscles."*

\* Effects will be generally felt throughout the country, as the Tenthers' President has called on Americans.

—Lambert, 1989, cited in *Journal of Management Education*

1. *Journal of Management Education*, 2000, 24(1), 1-10.  
 2. *Journal of Management Education*, 2000, 24(1), 11-20.  
 3. *Journal of Management Education*, 2000, 24(1), 21-30.

<sup>†</sup> Underlines the distributions of  $\Delta$  across  $\mu$  and  $\sigma$  for the two cases where  $\Delta$  was distributed.

"Again I must advise, with the greatest respect, that unless I am informed by the bank on what basis you are, we cannot give the loan." When I returned, he said the next morning, "I will talk with the board—again! Now, however, they have to go back to the bank on what is possible, then you can advise me."

\*For more information, visit [www.pearsoned.com](http://www.pearsoned.com).

<sup>†</sup> Note: In the left column, possible Latin names are given.

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Bf 110C fitted with an experimental oil cooling system for its DB 601 motors.

(Hanfried Schliephake)

‘Yes, but we have enough for the journey.’

“What had that got to do with it? I did not have time to think about that as I watched the roof of a house disappearing past our wing. The airspeed indicator still showed 190 m.p.h.

‘Don’t forget the lights and the harness!’

Leutnant Niklas murmured ‘I can’t go on any longer’, and slumped forward.

“There was a scraping sound and soil was flung against the cabin. We skidded over the ground for what seemed an eternity. I sat there tensely. So this is what a crash-landing is like. I had always imagined that it would be different. The crashing and splintering grew louder; there was a jerk—and everything was still.

“Then Leutnant Niklas shouted ‘Let’s get out of here!’ He had hit his head but had regained consciousness. He leapt from his seat, trying to run and at the same time to release his parachute harness. But it was no good and he fainted. I laid him out gently on the grass, and opened his blood-soaked flying suit. A doctor and others appeared and carried him away. I was surrounded by a lot of people, who started to ask questions. I realized just how lucky I had been.”

Later that day the wreckage of Niklas’ second Wellington was found\*.

The German answer to the British bomber ‘stream’ tactics was to set up more and more ground radar stations in front of and behind the original defensive line. The British, for their part, continued to reduce the time of their attacks, sending ever more compact ‘streams’.

Ground controlled visual night fighter attacks were all right on moonlight nights, but General Kammhuber had foreseen that the time would come when the

bombers would attack on dark nights, too. In anticipation of this he had asked the Telefunken company to build a radar set suitable for installation in a night fighter. In July 1941 the set, the *Lichtenstein BC*, underwent its first flight trials. The radar had a maximum range of two and a half miles, and was introduced into service in February 1942. By the autumn the majority of German night fighters were fitted with the *Lichtenstein BC* or its simplified version, the *C-1*.

By the end of 1941 it was clear to the German air force that the long awaited Me 210\*\*, the intended replacement for the Bf 110, was not going to materialize. To fill the gap thus created the Bf 110 was “cleaned up” aerodynamically and fitted with two DB 605B motors, each giving a maximum of 1,475 h.p. The new

\*\*See Profile No. 161.

The Giant Würzburg ground radar, the heart of the Himmelbett system of night fighter control. One of these sets was used to track the incoming bomber, while a second followed the intercepting German fighter. Plots from both of these sets were fed to a manually-operated plotting table, from which the German controller radioed instructions to the fighter pilot in the air to bring about an interception.



\*Niklas recovered from his wounds, but was later killed in action during a battle with U.S.A.A.F. day bombers.







formed by radio telephone of a lone bomber, far off course, approaching the area from the west. On the ground the men of the 13th Company, 211th Signals Regiment, manning the radar equipment at "Meise", worked as a well-knit team. One giant *Würzburg* was already tracking Schnauffer's aircraft, the other swung round to the west and began searching for the intruder. The latter was detected almost as soon as it came within range. The fighter control officer attached to 13/211, Leutnant Kühnel, passed Schnauffer a constant stream of instructions, which placed the Bf 110 pilot right on the raider's tail. In the rear of the Messerschmitt Leutnant Baro, the *Lichtenstein* radar operator, observed a small hump of light rise up from the flickering base line of his screen: enemy aircraft, range 2,500 yards. Baro took over the commentary until 1.30 a.m. when, in Schnauffer's words:—

"I recognised, 500 yards above and to the right, a Short Stirling and succeeded in getting in an attack on the violently evading enemy aircraft. It caught fire in the fuselage and the wings and continued on, burning. Then it went into a dive and crashed two miles north east of Aerschot."

At first light Kühnel drove out to look at the wreckage of the bomber, to verify the claim. He afterwards reported:—

"At 6 a.m. on 22.6.43 I was at the scene of the crash of the Short Stirling shot down by Lt. Schnauffer at 01.33½ hours on 22.6.43. The wreckage was 2 miles north east of Aerschot, map reference NK 31b. There was a crew of 7, all of whom were lying dead in the wreckage. The Short Stirling was completely wrecked in the crash and subsequent fire; the rudder and the rear gun turret were some 1,500 yards from the remainder of the wreckage." It had been Schnauffer's thirteenth kill.

However, the rigidly controlled *Himmelbett* system had its Achilles Heel, and this did not pass unnoticed in England. Just over a month after Schnauffer's thirteenth victory, during the attack on Hamburg on July 24, new R.A.F. tactics brought the whole system crashing down. The answer was as simple as it was effective; one thousand strips of aluminium foil, each measuring 30 cms. by 1.5 cms. This was one bundle of 'Window'; it cost about fourpence. Each aircraft in the attacking force dropped one such bundle per minute, which broke up in the slipstream to form a cloud of strips which gave a radar echo similar to that from a large bomber. The mass of clouds covered the screens of the *Lichtenstein* and *Würzburg* radars, making controlled interceptions virtually impossible.\*

'Window' paralysed the *Himmelbett* system, but it was not long before the Germans evolved new defensive tactics. Instead of intercepting bombers only during their inward and outward flights as they crossed the defensive line, the night fighters were now ordered to engage the enemy over the target itself. There light from fires, searchlights and target markers would silhouette the bombers so that the latter could be attacked visually with no help from the now almost



The two top-scoring German night fighter aces both spent almost their entire combat careers flying the Bf 110. (a) Major Heinz-Wolfgang Schnauffer shot down 121 bombers and survived the war, only to die in a car crash in France in 1950. (b) Major Helmut Lent shot down 102 bombers and died in October 1944 following a flying accident in a Bf 110. (Photos via Hans Ring)

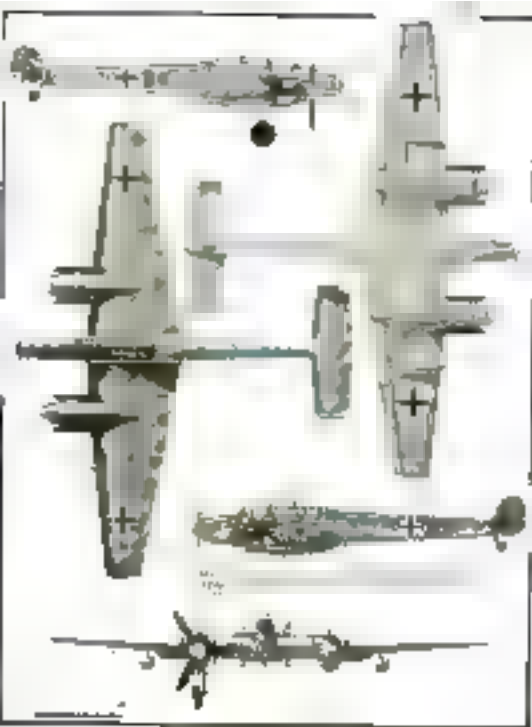


\*For full details of the methods used to counter the German defences, see "Instruments of Darkness", by Alfred Price, published by William Kimber of London, 1967.











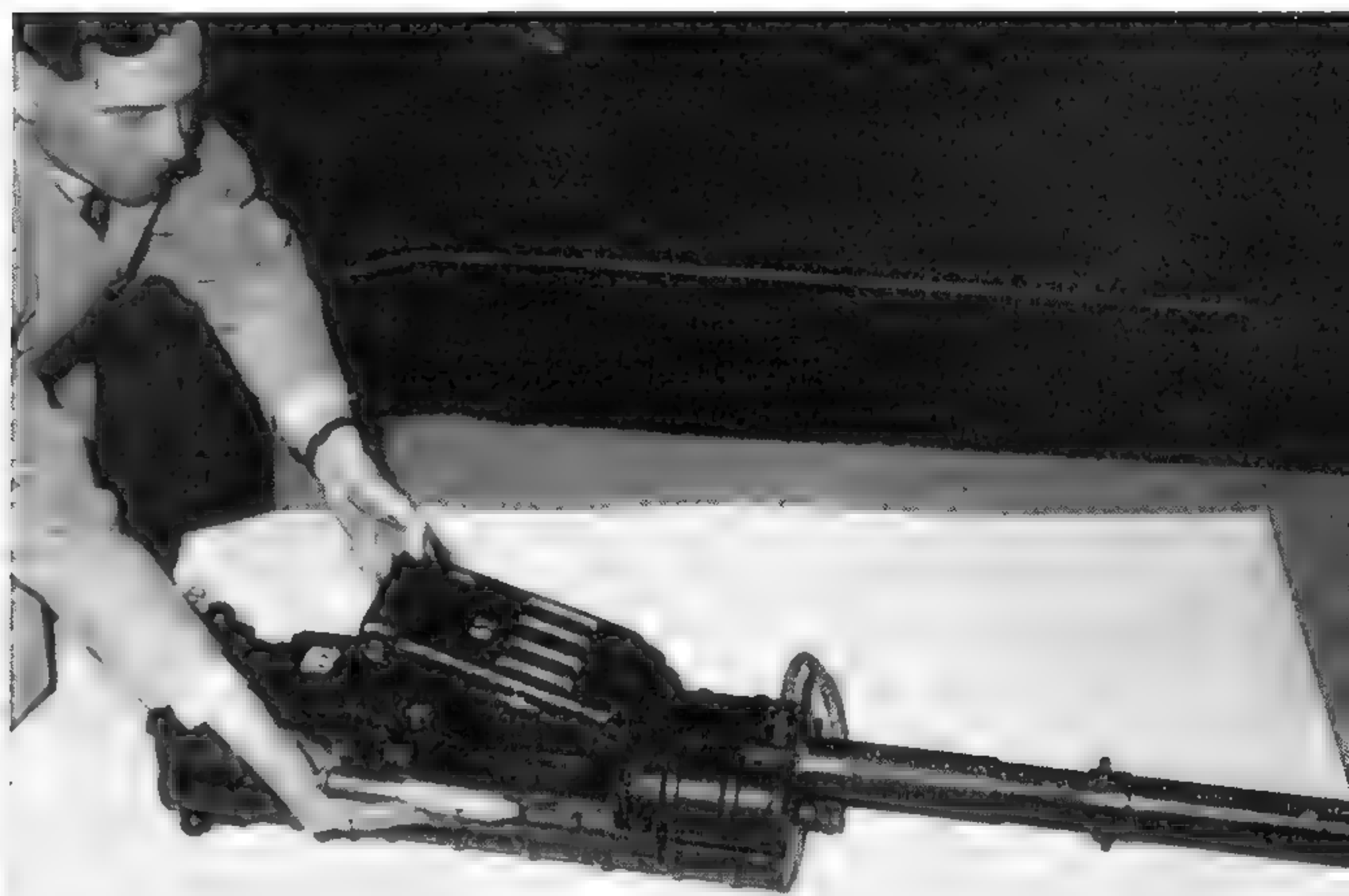


*Close-up of the cumbersome array of aerals carried by many Bf 110s early in 1944. The SN-2 radar, which employed the outer set of four aerals, was not affected by the type of 'Window' initially used by the R.A.F. The central aerial array belongs to the earlier FuG 212 Lichtenstein radar; this entirely separate and easily jammed radar had still to be carried because initially the SN-2 had such a poor performance at short ranges—the early versions could not detect targets inside a range of 400 yards. (I.W.M.)*

"At 2.54 a.m. I saw the first Lancaster at about 10,000 feet, flying directly in front of me on a westerly heading. I closed in and opened fire from about 150 yards, somewhat to the right and 150 feet below. Its No. 3 engine caught fire. As I broke away below him, return fire from the rear gunner passed to my left. From the beginning of the engagement both aircraft were caught by our own searchlights. When the Lancaster pilot attempted to escape in a left diving turn he came into my sights again and I was able to give him a short burst. He went down crashing at 2.56 a.m., a few hundred yards from Ufer.

"I immediately set off eastwards, obtained another contact from my radar operator, dived again, and saw a Lancaster flying directly above me on a westerly heading. On account of the good visibility I was able to keep the Lancaster in sight as I turned sharply round to a westerly heading. I fired from more or less the same position, again at No. 3 engine. He went into a dive and crashed at 3.01, on the shore of the Apenrader Bight.

"After that I headed north, and my radar operator soon picked up yet another contact. I was able to make out the aircraft about 1,200 yards away. My first attack was the same as the others, from 150 yards range, a little to the right and 150 feet below. As the No. 3 engine caught fire we were held by a



*(a) Cause—the 30 mm. MK 108 cannon, seen here with one of the explosive rounds it fired. This weapon was fitted in the upper nose position of the majority of Bf 110s which saw action during the latter part of the war. (b)—and effect. The damage to this Spitfire was caused by a hit from a single explosive round from an MK 108, fired during a test on the ground.*



searchlight, and despite the moonlight it was dazzling. The Lancaster pilot pulled his aircraft up (perhaps he was also dazzled, or wanted to reduce his speed to make it easier for his crew to abandon). The enemy aircraft now filled my horizon. I pulled up to within 20 yards and with a few rounds set the No. 2 engine and the fuselage on fire. The aircraft broke up and crashed at 03.11 a.m., one and half miles to the west of Ustrup."

As the Lancaster exploded the windscreen of Meihnsner's Bf 110 was flecked with opaque black oil from his victim's tanks. The German pilot was forced to break off the action, and landed back at Jagel at 03.30. That night the R.A.F. lost forty-one bombers.

Note the differences between Schnauffer's interception, carefully controlled from the ground, and the lone-wolf nature of Meihnsner's; the latter had been lucky to stumble on to the bomber stream, but once he





Figure 1.1: A large aircraft.







Above and top of facing page: Here seen undergoing ground engine runs, this Bf 110G of Stab I./N.J.G. 4 carries an interesting shark's teeth nose marking. Note the wing tip aerials, which belong to the Flensburg homing device which picked up radiations from the British bombers' 'Monica' tail warning radar sets. (R. C. Seeley)

binations, many Bf 110s were fitted with *Schräge Musik* ("Oblique Music"): paired 20 mm. MG/FF or MG 151 cannon mounted against the rear bulkhead of the cockpit, and arranged to fire upwards and forwards. The pilot sighted through a reflector sight which was attached to the roof of the cockpit, above his head. The angle to which the guns were set de-

During the early part of 1944 the German night fighter force reached the peak of its success, with the successful application of the *Zahme Sau* tactics. Oberst Viktor von Lossberg (below) was the originator of these tactics. (von Lossberg)



pend, within limits, upon the wishes of the individual pilot: between 70 and 80 degrees was the most usual.

It was the successes of Meihnsner and others like him with the Bf 110 that prompted Generalfeldmarschall Milch to make the statement quoted at the beginning of this *Profile*. But, as we have seen, an aircraft with a better performance was needed. That selected was the Junkers Ju 88G, a night fighter version of the Ju 188 already in production for the bomber and reconnaissance rôles. The other serious contender was the Heinkel He 219. It was faster and more manoeuvrable than the Ju 188 but was rejected, first because it had only one man looking forwards (two in the Ju 88G)—an important factor during freelance *Zahme Sau* missions—and secondly, because it would have meant introducing a completely new design into mass production. The Ju 88G did not become available until early 1944 and in the meantime the Bf 110 continued to roll-off the assembly lines in large numbers; during 1943 a total of 1,580 of these aircraft was built, the majority destined for the night fighter force.

The visual search tactics were very successful during the light summer nights, but they were no more than a stop-gap pending the introduction of new equipment able to work in spite of the "Window" jamming. At the end of 1943 three new devices entered service in the German night fighter force, to assist the crews to find their targets: the *Lichtenstein SN-2*, *Naxos* and *Flensburg*. The *SN-2* was a completely new night fighter radar set which worked on a frequency not jammed by the "Window" then being used by the R.A.F. It had a maximum range of four miles. *Flensburg* and *Naxos* were both radar homing devices, the former on the emissions of the British "Monica" tail-warning radar, the latter on the emissions from the H2S blind bombing device.





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*The end for the German night fighter force. During the rush into Germany at the close of the war many of the bases used by the Luftwaffe were over-run. This one, near Eritzer, fell to the U.S. Third Army. (a) As the Americans approached the Germans blew up everything possible, to prevent it falling into enemy hands. (b) But they were not quick enough and some of the aircraft—these belong to 9./N.J.G. 1—were captured almost intact. Note that each aircraft has had its port main wheel tyre punctured by the Americans, to prevent unauthorized flights. (U.S.A.F.)*



course of the bombers. Only then were they free to go into the attack.

With these tactics the German defenders were able to inflict serious losses on the raiders during the first months of 1944. On January 21, 55 bombers were lost out of 648 attacking Magdeburg, and a week later 43 were shot down out of 683 attacking Berlin. But even these huge scores were eclipsed when 78 bombers were shot down out of a force of 823 attacking Leipzig on February 19.

The hard-fought battle between Bomber Command and the German defenders was now nearing its climax. The war diary of NJG 6 for a twelve day period during March 1944 gives some idea of the intensity of the battle then being fought, as seen through German eyes. NJG 6 operated as part of the Seventh Fighter Division, responsible for the defence of southern Germany. The *Geschwader* comprised two *Gruppen* of Bf 110s, I. at Mainz/Finthen and II. at Stuttgart/Echterdingen. The unit also operated a few Ju 88s to seek out and report on the position of the bomber streams, and drop flares to mark them.

**"15 March.** Target Stuttgart. Own take-off too early. Consequently there was a lack of fuel. 26 Bf 110s and 3 Ju 88s took off. 3 four-engined bombers shot down for certain, and 2 probables. 5 Bf 110s crashed due to their running out of fuel, one made a belly landing and one force-landed at Zürich/Dübendorf (in Switzerland)." (R.A.F. losses 36 out of 863.)

**"18 March.** British penetration into the area Frankfurt-Mannheim-Darmstadt (the target was

Frankfurt). 24 Bf 110s and 2 Ju 88s took off. 1 bomber was shot down for certain, and 3 probables. 1 Bf 110 was shot down and one was rammed by an enemy night fighter and crashed." (R.A.F. losses 22 out of 846.)

**"22 March** Target Frankfurt. 21 Bf 110s and 2 Ju 88s set out. Oberleutnant Becker\* scored 6 victories. The air situation was not at all clear. The enemy turned when to the north of Terschelling, towards the south-east in the direction of Osnabrück, but this was not recognised. From Osnabrück on no contact was made. The enemy main force was not recognised until it was to the north of Frankfurt." (R.A.F. losses 33 out of 816.)

**"23 March.** Received false reports of an enemy force moving in an easterly direction. The target was Paris (in fact it was Laon). 20 Bf 110s and 1 Ju88 took off, but in vain." (R.A.F. losses 2 out of 143.)

**"24 March.** The enemy approached over the North Sea and Jutland, to Berlin. The return flight touched the northern tip of our own divisional area. Radio Beacon 12 was subjected to music-type interference. Crews encountered severe icing when breaking through the overcast. Vain attempts were made to make contact with the bomber stream during its return flight. Our own flares over Berlin were too high (20,000 feet). Very disciplined firing by the flak

\*Martin Becker was to end the war as a *Hauptmann*, with 47 confirmed victories.





R.A.F. officers examine a Bf 110G fitted with the latest FuG 218 Neptun radar, which was just coming into service as the war ended. Note that this aircraft has had its propellers removed, another measure to prevent unauthorized flights.

over Berlin.\* Corps communication channels could be heard well, in spite of the enemy interference. In action were 11 Bf 110s to Berlin, 5 Bf 110s against the returning stream, 3 Bf 110s engaged in *Himmelbett* operations, and 1 Ju 88 reconnaissance aircraft. 1 victory to Oberleutnant Becker.” (R.A.F. losses 72 out of 811—obviously other units did better.)

“26 March. About 500 bombers approached over the Zuider Zee on an easterly course towards the Rhine. They then turned south towards Essen-Oberhausen-Duisberg (the target was Essen). Our radar and ground observers recognised the turn too late. Our own reconnaissance aircraft, a Ju 88 flown by Hauptmann Wallner, reported enemy activity only over the Ruhr area as a whole. The direction of the (enemy’s) approach and return flights could not be recognised from the running commentary. Therefore it was not possible to get into the bomber stream. Due to the devious approach and the strong

\*That is to say the gunners held their fire while the fighters engaged.



headwind, II. NJG. 6 did not arrive at the target before the end of the attack. Severe icing was reported. 21 Bf 110s on *Zahme Sau* operations, 3 Bf 110s on *Himmelbett*, 1 Ju 88 on reconnaissance. 3 Bf 110s ran out of fuel and crashed, and one made a belly landing.” (R.A.F. losses 9 out of 705.)

The German crews were ordered to pursue the raiders to the limit of their endurance and, once contact had been made, they were to break-off the action only when their fuel had almost run out; they were then to land at the nearest airfield. There was thus little reserve in hand if the fighter went too far while, say, chasing a “corkscrewing” bomber. Such losses due to fighters running out of fuel were risked and accepted—this was all part and parcel of the *Zahme Sau* tactics.

The greatest night battle, indeed the greatest air battle, of all time was fought when the R.A.F. next visited Germany, on March 30. The force of 795 bombers attacking Nuremburg was successfully engaged by twenty *Gruppen* of twin engine fighters, about 200 aircraft. In the slaughter that followed ninety-four bombers were shot down.

It is of interest to examine the composition of the German night fighter force at this, the high water mark of its existence. The Quartermaster General’s records show that there were 565 night fighters on strength—Ju 88s, Bf 110s, Do 217s and He 219s; of these about 320, or nearly sixty per cent., were Bf 110s.

Between November 18, 1943 and March 31, 1944 R.A.F. Bomber Command lost 1,047 aircraft, probably three-quarters of them to night fighters. With so many victories to be shared out it is no wonder that the leading German night fighter aces amassed extremely high scores. By the autumn of 1944 Major Helmut Lent, a Bf 110 pilot and at that time Kommodore of NJG 3, had 102 confirmed victories to his credit.\* Lent was fatally wounded on October 5, 1944, in a crash following an engine failure.

\*This Profile’s author has done extensive research into the veracity of the German night fighter pilots’ victory totals, and is satisfied that these are substantially accurate. Unfortunately space considerations preclude a discussion of this controversial subject here.

Under entirely new management. (Left) Luftwaffe ground crewmen paint R.A.F. markings on a Bf 110 after the war. (Below) An R.A.F. officer supervises the removal of the rearwards-firing twin-gun MG 81 installation. (I.W.M.)







*A Bf 110G being readied for flight. The long barrels of the two 20 mm. MG 151 cannon, with their flash eliminators, extend far in front of the nose from a position more usually occupied by the shorter-barrelled MK 108 weapons. This photo also appears on the cover. (R. C. Seeley)*

Before the war ended Lent's huge score was topped by another Bf 110 pilot, Major Schnauffer. Schnauffer ended the war as Kommodore of NJG 4, with 121 confirmed victories. It is testimony to his skill as a pilot that three of this total were shot down using upwards firing cannon while formating underneath a bomber which was actually in a corkscrew. Schnauffer's most successful twenty-four hours was on February 21,

1945. He shot down two bombers early in the morning, and that evening he managed to work his way into the centre of the bomber stream and knock down seven more. Schnauffer survived the war, but was killed in 1950 in a road accident.

From the invasion of France in 1944 to the war's end the story of the German night fighter force was one of unremitting decline. First the capture of France

*Below and facing page: Three views of the Bf 110G-4 which was brought back to Britain after the war, and exhibited during the display of captured German equipment held at Farnborough in October and November 1945. (I.W.M. and U.S.A.F.)*





punched a great hole in the German air reporting network, seriously reducing the warning time available to the defenders. Then the R.A.F. started jamming the SN-2 radar, rendering it useless. From the autumn of 1944 the German fuel reserves began to waste away, as one by one the refineries and storage centres were bombed to ashes. On December 31, 1944 the German night fighter force had 913 aircraft on strength\*, but many of these were grounded for want of fuel. During this period the night fighter units were called upon to operate in the ground attack rôle. The Bf 110s carried a rack for two 550 lb. bombs under the fuselage and, if no drop tanks were carried, two 110 lb. bombs under each wing. Night ground attack was a particularly hazardous business, and losses were accordingly high.

Also, during the final months of the war, the German night fighter crews were the subject of the unwelcome attentions of the Mosquitos of No. 100 Group, R.A.F. Typical of these operations was one on the morning of March 19, 1945, as Hanau and Witten were being attacked. Afterwards Flt. Lt. Winn, a Mosquito pilot with No. 85 Squadron, reported:—

“On patrol in the Hanau target area obtained several Perfectos\*\* contacts, one of which was selected. After a 15 minute chase this was converted to A.I. (radar contact), range six miles. Continued in an easterly direction for a further five minutes and obtained a visual, range 1,500 feet height 5,000 feet. Target was followed in and out of cloud. Eventually he commenced a gentle descent, followed by the Mosquito, which led to a fully lighted airfield (Kitsingen). After several chases round the airfield the enemy aircraft decided to land; closing to 400 feet the target was recognised as an Me 110 with its undercarriage down. The first burst, fired from 100 feet, scored no strikes. The Mosquito had great difficulty in keeping behind without stalling. A second burst was fired as the enemy aircraft was on the approach, causing the port engine to explode. The enemy aircraft dived into the ground and was scattered over a wide area on the downward end of the flarepath. 0521 hours.”

The airfield was not Kitsingen but Gerolzhofen, situated a few miles to the north east. The German

*\*\*Perfectos—device fitted to British night fighters, to enable them to home on the emissions from the German aircraft identification equipment.*

*\*Some 150 of which were Bf 110s.*







One of the very few Bf 110 night fighters still in existence, this example was photographed at R.A.F. Biggin Hill in 1968.

pilot, Oberfähnrich Erichsen, and his crew survived the crash, though all suffered wounds.

Just over a month later came the collapse of the Third Reich.

So it was that the Bf 110 ended its career, in action from the first day of the war to the last; and the two months' thrashing it took over Britain in 1940 has been allowed to cloud its five years of work in the defence of the German homeland. It is true that the Bf 110 was relegated to night operations mainly because it suffered crippling losses during the daytime. The same could be said of the Lancaster. But it was at night that many of the greatest air battles were fought out, often between these two stalwarts which were the backbone of their respective air forces.

**Series Editor: CHARLES W. CAIN**

## SPECIFICATION BF 110G-4 Night fighter

### Dimensions

Span 53 ft. 4½ in.; length 41 ft. 6½ in.; height 13 ft. 1½ in.; wing area 413 sq. ft.

### Crew

The basic crew comprised a pilot and a radar operator; this was supplemented, more frequently as the war progressed, with a gunner whose task it was to keep watch for enemy fighters.

### Powerplants

Two 1,475 h.p. Daimler-Benz DB 605B twelve-cylinder inverted Vee liquid-cooled engines; V.D.M. three-blade propellers.

### Armament

This varied, but typically it comprised two 30 mm. MK 108 cannon with 135 rounds per gun in the upper half of the nose and two 20 mm. MG 151 cannon with 300 and 350 r.p.g. in the lower half of the nose. Additionally there might be a *Schräge Musik* installation of two

20 mm. MG/FF or MG 151 cannon arranged to fire upwards and forwards from the rear cockpit bulkhead, and a pair of 7.9 mm. MG 81 guns for rear defence. A maximum bomb load of 1,540 lb. could be carried.

### Weights

Empty 11,220 lb.; normal loaded 20,700 lb.

### Performance

Maximum speed—342 m.p.h. at 23,000 ft., 311 m.p.h. at sea level. Maximum range, when fitted with two 198 imp. gal. drop tanks—1,305 miles. Operational ceiling—26,000 ft.

### Radar Fitted to the Bf 110

*FuG 202 Lichtenstein BC* and *FuG 212 C-1*

First introduced into service February 1942.

Frequency 490 megacycles.

Range 2½ miles.

*FuG 220 Lichtenstein SN-2*

First introduced into service September 1943.

Frequency originally 91 megacycles; later this could be varied prior to take off, within the range 73 to 91 megacycles.

Range 4 miles.

*FuG 218 Neptun V*

First introduced into service in January 1945.

Frequency: six frequencies were available to the operator, between 158 and 187 megacycles. The operator would select the one with the least interference.

Range 3 miles.

### Note on the German night fighter colour scheme

At first sight it might seem strange that the standard colour scheme of the German night fighter force for much of the war should have employed such light colours. But this scheme was arrived at after considerable thought. Even on the darkest of nights there is some light. When aircraft are seen they appear as dark shapes, silhouetted against the lighter background of the sky. Hence the light colours, designed to reduce to a minimum the contrast between the German fighters and their background. A similar light colour scheme was considered for R.A.F. bombers, but was not introduced because aircraft illuminated by searchlights would have become even more conspicuous.

**Bf 110 production**, all variants: Up to the end of 1939, approx. 573; 1940, 1,083; 1941, 784; 1942, 580; 1943, 1,580; 1944, 1,525; 1945, 45. From 1941 on the majority of Bf 110's were delivered to the night fighter force.

### Units with Bf 110 night fighters on strength, April 9, 1945

*Stab*, 1, 4 and 7/NJG 1.

*Stab* NJG 4.

*Stab*, 4 and 7 NJG 5.

*Stab* and 7 NJG 6.





10th Bomber Group  
 Headquarters, 10th Bomber Group, 10th Bomber Group



B-24 Liberator, 10th Bomber Group, 10th Bomber Group, 10th Bomber Group



B-24 Liberator, 10th Bomber Group, 10th Bomber Group, 10th Bomber Group



B-24 Liberator, 10th Bomber Group, 10th Bomber Group, 10th Bomber Group



B-24 Liberator, 10th Bomber Group, 10th Bomber Group, 10th Bomber Group



B-24 Liberator, 10th Bomber Group, 10th Bomber Group, 10th Bomber Group



B-24 Liberator, 10th Bomber Group, 10th Bomber Group, 10th Bomber Group



B-24 Liberator, 10th Bomber Group, 10th Bomber Group, 10th Bomber Group